Committing to Transparency

to Resist Corruption

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Paris, May 30 2011

Public Private Partnership Economics

Motivation

- Corruption in public markets is a problem in both developing and developped countries.
- Good legislation is not sufficient to combat corruption specially in highly corrupt environments;

- The business community has under the last decade seen the rapid development of Corporate Social Responsibility programs with Codes of Conduct and Standards of Ethics e.g., UN Global Compact (chapt. 10).
- The AC community has since its inception contributed to developing various forms of mechanisms engaging firms and citizens to complement the legal system in order to reduce corruption e.g. IP and EITI .
- The need for innovative tools has been emphasized e.g., GCR 2009.

Literature

On corruption in competitive procedures:

- Celentani, M. and J. Ganunza (2002),

- Compte, O. et al. (2005).

- Burguet, R. and Y.-K. Che (2004),

- Kosenok and Lambert-Mogiliansky (2009)

On commitment in games

- Kalai et al.(2010)

- Bade et al. (2009).

A contribution of this paper is to investigate mechanisms of commitment not to bribe in competitive procedures managed by a corrupt agent.

The Model

A gvt looks for a firm to exploit its oil resources at a fixed price P. It cares about the firm's contribution to the dvpt of the industry.

- Each firm $i \in \{1,2\}$ proposes a version of the project $q_i \in \{\underline{q}, \bar{q}\}$ with $\bar{q} > \underline{q}$.

- With probability ρ the firm's technology allows for $\bar{q}$ at cost $\bar{c}$ and with probability $1 - \rho$ for $\underline{q}$ at cost $\underline{c}$.

- $\underline{c} < \bar{c}$ or $\underline{c} > \bar{c}$ i.e., the high quality type may also be cost efficient.

- Firms submit their quality truthfully.

Benchmark: the gvt observes q

The beauty contest:
$$\max\{q_1, q_2\}$$
In equilibrium trivially (one of) the best project wins and if
$$\overline{q} - \overline{c} > \underline{q} - \underline{c}$$
we also have social-economic efficiency.

The profits of the two firm types are
$$\Pi^N(\overline{q}) = (\tfrac{1}{2}\rho + (1-\rho))(P - \overline{c}),$$

$$\Pi^N(\underline{q}) = \tfrac{1}{2}(1-\rho)(P - \underline{c}).$$

Assume now that

I. the gvt cannot observe the quality (too complex) so it must _rely on an agent_ to evaluate the offers.

2. The agent has _discretion_ (evaluation not a transparent process) he can upscale with m $(q + m)$. His discretion can be weak ($m < \bar{q} - \underline{q}$) or strong ($m > \bar{q} - \underline{q}$).

3. The agent is _corruptible_: he trades the selection advantage (m) for bribes.

4. The firms _compete in bribes_ for the selection advantage in an auction like game.

Beauty contest with corruption

The timing of the game with corruption is as follows:

1. Each firm $i \in \{1,2\}$ privately learns its type $q_i \in \{\underline{q}, \bar{q}\}$;

2. Each firm $i \in \{1,2\}$ submits an offer (q_i, b_i), where $b_i \geq 0$;

3. The agent selects firm i if either
   - $b_i > b_{-i}$ and $q_i + m > q_{-i}$, or
   - $b_i < b_{-i}$ and $q_i > q_{-i} + m$.

4. The submitted bribe is paid by the winner (whether corruption was actually needed or not).

Proposition 1

- *With no corruption or with corruption but weak discretion $(m < \bar{q} - \underline{q})$ the winner of the contest is a high quality firm type (when it exists) whatever its cost.*

- *With corruption and full discretion $(m > \bar{q} - \underline{q})$ the winner of the contest is a low cost firm type whatever its quality.*

- *When the agent is corruptible, both firm types offer strictly positive bribes in equilibrium.*

Proposition 2

In a beauty contest where firms compete in projects the no-corruption equilibrium payoffs dominate for both firm types the equilibrium payoffs in the game with corruption in the following situations:

(i) *Weak discretion;*

(ii) *Full discretion and the high quality firm type has a lower cost* $(\bar{c} < \underline{c})$;

(iii) *Full discretion and the low quality firm type has the lower cost* $(\bar{c} > \underline{c})$ *and*

$$\rho \leq \frac{P - \underline{c}}{P - \underline{c} + 2(\bar{c} - \underline{c})}.$$

Intuition

Under the conditions (i) and (ii) corruption has no impact on the equilibrium allocation of the project. Corruption boils down to pure extortion: no firm type benefits from it and both firm types prefer the no corruption regime.

Under condition (iii), corruption has the potential to affect selection but competition in bribes for the project is too costly. Indeed corruption introduces costly price competition where there was none.

Example:

If $\bar{c} = \underline{c}$ then any $\rho \leq 1$ satisfies the condition so no corruption always dominates. On the other hand when $P - \underline{c} = (\bar{c} - \underline{c})$, we need $\rho < 1/3$ to secure the dominance of the no-corruption regime.

Committing to transparency

From Prop. 2 we know both types may strictly prefer the no corruption regime. From Prop. 1 we know that no firm would *unilaterally* commit not to bribe, what about a commitment that is binding only *conditionnally* on the other firm also committing?

The timing of the beauty contest game with interim conditional commitment is as follows:

1. Each firm $i \in \{1,2\}$ privately learns its type $q_i \in \{\underline{q}, \bar{q}\}$;
2. Each firm $i \in \{1,2\}$ decides whether to make a conditional commitment to transparency.
3. The commitment decisions are publicly announced or
3'. The commitment decisions are private (but a firm that committed learns whether its commitment is in force).

4. Each firm $i \in \{1,2\}$ submits an offer (q_i, b_i), under the constraint that $b_1 = b_2 = 0$ if both firms committed to transparency

5. The agent selects firm i if $b_i = b_{-i} = 0$ and $q_i > q_{-i}$ or if $b_i > b_{-i}$ and $q_i + m > q_{-i}$, or $b_i < b_{-i}$ and $q_i > q_{-i} + m$.

Proposition 3

There exists an equilibrium of the beauty contest game with CC in which firms commit to transparency whatever their types iff (i), (ii) or (iii) of Prop.2 are satisfied.

The intuition is straightforward: the conditional commitment mechanism allows firms to cooperate and achieve the higher no corruption payoffs.

Unilateral commitment with Bonus

Committing firm are rewarded with an official selection advantage h, so their offer is worth $q + h$.

Proposition 6

- *For $h > m$ both firm types commit independently of the type of discretion (weak or large) and of the costs.*
- *For $h < m$,*
  a) *under weak discretion, no firm type commit.*
  b) *Under large discretion there may exist a separating equilibrium where the firm of the high type wins without corruption if there is any. If $\overline{c} > \underline{c}$ and $\rho > \frac{2}{3}$ no firm commits.*

Proposition 6 shows that unilateral commitment with bonus has some potential to deter corruption. But unless the bonus is larger than the selection advantage available in corruption, the beauty contest with UCB is characterized by more corruption than the beauty contest with CC.

Conditional Commitment with Bonus

Committing firms are rewarded but commitment is binding only if the other firm also commits. h; $h + \overline{q} > m + \underline{q}$, $h < m$.

The CCB mechanism introduces two asymmetries in the beauty contest with corruption

- the selection rule is asymmetric,

- the bribing game is asymmetric (in beliefs)

First, a simpler case supported by $\mu = 0$ i.e, if a firm deviates the other believes it is of the low quality type with probability 1.

Proposition 8

For $\rho \leq \frac{2}{3}$ there exists an equilibrium of the asymmetric information beauty contest game with conditional commitment and bonus with no corruption.

A similar eq. can be depicted for $\mu = 1$ s.t. $P > 2\overline{c} - \underline{c}$

Better than both the CC and UCB mechanism.

General case $\mu \in [0,1]$.

Proposition 9

In the asymmetric information beauty contest game with conditional commitment with bonus, there exists an equilibrium with full corruption deterrence.

Intuition: when moving away from extrem beliefs, both types of deviator can be forced to bribe so much that it is not worth anymore. The equilibrium of Prop 9 is supported by $\mu = 1/2$.

The out-of-equilibrium bribing strategies are rather complex however: they are all mixed strategies on different intervals and with mass points. Yet, this result shows on the potential of the CCB mechanism.

Conclusions

- Providing and managing a reliable audit mechanism allowing firms to commit not to bribe has the potential to significantly reduce corruption.
- Unilateral commitment is not IC in the absence of reward. But a mechanism of conditionnal commitment with no reward still can achieve substancial reduction of corruption.
- If firm can be rewarded with a sufficiently high bonus, UCB can achieve some corruption reduction while CCB has the potential to fully eliminate corruption.

Caveats

Very simple setting with ex-ante symmetric firms, two levels of quality, of costs. Does not generalize straightforwardly. Yet, our results can be relevant to e.g., asymmetric situations with one local (presumably low quality) and one foreign firm.